

Undergraduate Research Symposium May 19, 2017 Mary Gates Hall

Online Proceedings

POSTER SESSION 1

Commons East, Easel 83

11:00 AM to 1:00 PM

Before Our Eyes and Under Our Noses: Sex Trafficking in the U.S.

Eleanore (Cendri) Johnson, Sophomore, Linguistics, International Studies, Shoreline Community College
Mentor: Rachel David, Gender Studies, Shoreline Community College

Sex trafficking, the practice of transporting and coercing persons into commercial sexual exploitation, is a global problem that's supported by our actions (or lack thereof) here in the U.S. The question this report seeks to answer is how international sex trafficking continues to be supported in the U.S. and in Washington State in particular. Sex trafficking is a difficult topic to research, as most data lies in illegal activities among hidden populations. If, however, people are able to inform themselves about the impact of sex trafficking on the sex industry in the U.S., they may demand reform on both a societal and governmental level to combat sex slavery. My prediction is that a large factor contributing to sex trafficking's success is simply the public's lack of knowledge on the subject. Additionally, it's likely that laws and societal norms as well as lack of resources/funding for anti-trafficking efforts are also contributing factors. To answer my research question I've read through various encyclopedias, scholarly journals, organization websites, and even a report on human trafficking in Washington State. I've also conducted an interview with a survivor of sex trafficking who now volunteers with helping victims of trafficking. My research focuses on development of sex trafficking, who supports it, why it thrives in Seattle, and what needs to be done to stop it. Research shows that sex trafficking is prominent in Washington State due to location, proximity to the border, and client supply. Changes in societal attitudes in conjunction with revised laws that better protect victims and punish the traffickers and greater support/funding for organizations against sex trafficking will all serve to combat this problem. If the world decided to stop human sex trafficking, then millions of people could be spared from a very tragic fate.

POSTER SESSION 1

Commons East, Easel 82

11:00 AM to 1:00 PM

The Acoustics of Deceit

Lydia Kathryn (Lydia) Castro, Senior, Linguistics
UW Honors Program
Mentor: Richard Wright, Linguistics

A commonly held belief is that there is a measurable/observable difference between deceptive and honest speech, yet few studies provide enough information to support this claim. Existing studies focus their analyses solely on prosodic elements of speech (like pitch) and have come up with mixed results (in part due to the difficulty of eliciting genuine lies from subjects). Other studies have found similarly variable results with speech characteristics like pitch, but also found noticeable differences with temporal measures like speaking-rate. Ultimately, the pre-existing studies agree that more data is needed and more studies should be conducted in this field. The present study aims to further explore the question of whether dishonest speech has any detectable acoustic differences from honest speech. Acoustic and prosodic elements of speech (ie. intensity, pitch) are examined between the honest and deceptive tasks for differentiation and potential patterns. Truthful and deceptive utterances are elicited through a modified card game task conducted at the soundbooth in the UW Phonetics Lab. The game task can be played both honestly and with bluffing (similar to Poker). To elicit the words "jack", "queen", and "king" with a high level of density, the card deck used in these tasks exclusively contains the three different face cards from multiple standard playing card decks. Preliminary observations suggest that when a talker lies, they limit the prosodic information of their lies with quieter speech, flattened pitch contours, and reduction of utterance duration. While existing studies in the literature have noted that many acoustic differences between honest and deceptive speech are quite small and exhibit large degrees of speaker and task variability, their conclusions seem to concur thus far with the preliminary observations of this study.

POSTER SESSION 1

Commons East, Easel 67

11:00 AM to 1:00 PM

Is Language Arbitrary? Sparse Regression to Quantify the Extent of English Form-Meaning Relations

Nelson Liu, Junior, Linguistics, Statistics

Mary Gates Scholar

Mentor: Noah Smith, Computer Science & Engineering

Mentor: Gina-Anne Levow, Linguistics

Modern linguistic theory has held that language is arbitrary; that is, there is no connection between the physical form (spelling or pronunciation) of a word and its meaning. However, recent work has used distributional semantic vector representations of words to verify non-arbitrary form-meaning pairings (called phonesthemes) in English that were proposed in past psycholinguistics literature. One notable phonestheme is the prefix "gl-", which occurs at the beginning of several English words relating to light or vision (e.g. "glow", "glint", "glisten"). In this work, we use sparse regression to quantify this non-arbitrariness by extracting phonesthemes from word vectors. We also conduct human subject studies with a cloze-style task with non-English words containing phonesthemes, in order to verify that candidate phonesthemes have psychological reality in the lexicon of native speakers. In addition, we explore phonesthemes of other languages and across languages through multilingual word vectors. Uncovering the true extent of non-arbitrariness in human languages is important for furthering understanding of language comprehension and production, as well as advancing pre-existing linguistic theory.

SESSION 1R

COMPUTER SCIENCE: DISTRIBUTED SYSTEMS, VERIFICATION, SECURITY AND HCI

Session Moderator: Kurtis Heimerl, Computer Science and Engineering

JHN 111

12:30 PM to 2:15 PM

* Note: Titles in order of presentation.

Drunk User Interfaces: Using Smartphone-Based Human Performance Tests to Detect Inebriation

Sayna Parsi, Senior, Linguistics, Informatics

Mary Gates Scholar

Mentor: Jacob Wobbrock, The Information School

The standard quantitative method for assessing inebriation is to use a breathalyzer. However, breathalyzers are primarily owned by law enforcement and used only after a drunk individual is caught behind the wheel. Unlike breathalyzers, smartphones are one of the most ubiquitous technologies in today's society. If smartphones could be used to reliably detect inebriation, they could be employed in ways to prevent

drunk driving (e.g., by linking the smartphone to the car) or to incent good behavior (e.g., by lowering insurance for those who pass an app-based test before driving after 10 pm). We are running an ongoing study to examine whether or not challenging human performance tasks (e.g., typing, swiping, reacting) can be implemented on the smartphone to detect inebriation and prevent drunk individuals from getting behind the wheel. These tasks not only assess drunkenness from a performance perspective, but also from the perspective of the smartphone sensors.

POSTER SESSION 2

Balcony, Easel 95

1:00 PM to 2:30 PM

The Ideology of "Following Your Passion" as a Factor that Dissuades Women from STEM Fields

Shi Lu, Senior, Linguistics, Psychology

Mentor: Sapna Cheryan, Psychology

Mentor: John Oliver Siy, Psychology

Women are underrepresented in STEM (Sciences, Technology, Engineering and Math) fields in U.S. contexts. In this study, I investigate whether the prominence of the "follow your passion" ideology in choosing careers may be one factor that contributes to the gender discrepancy in STEM fields. Passion ideology is the idea that people choose their career mainly according to their idealistic personal interest. Previous research has shown that in terms of career preference, women tend to choose feminine stereotyped careers and are less interested in masculine stereotyped careers, and vice versa for men. STEM fields are masculine stereotyped. Therefore when U.S. society in general advocates for the priority of personal interest in career choice, we hypothesize that passion ideology mediates the relations between gender and interest in STEM fields, where women are less likely to develop interest in STEM. Considering passion ideology is less popular in Asian culture, in the current study, I primed Asian American women with either their American identity or Asian identity by using leading questions. Then I measured how interested participants are in engineering careers and art careers and how much participants agree that people should either follow their passions or be practical when choosing a career using a questionnaire. Following predictions are made: participants primed with American identity will be less interested in engineering careers than those primed with Asian identity, but not for art careers; participants primed with American identity will express stronger beliefs in the passion ideology than those primed with Asian identity; weaker interest in engineering careers when primed with their American identity will be mediated by stronger beliefs in the passion ideology. If these predictions stand, it suggests that, in U.S. context, these culture factors can partially explain the gender discrepancy in STEM fields.

SESSION 2K

PSYCHOLOGICAL AND INTERPERSONAL FUNCTIONING

Session Moderator: Todd Herrenkohl, Social Work
MGH 271

3:30 PM to 5:15 PM

* Note: Titles in order of presentation.

The Effects of Grammaticality and Morphological Complexity on the P600 in L2 English Speakers

Trevor Kincaid McAllister (Trevor) Day, Senior, Linguistics

Mary Gates Scholar, UW Honors Program,

Undergraduate Research Conference Travel Awardee

Mentor: Lee Osterhout, Psychology

Mentor: Judith McLaughlin

It is an open question how similar second-language processing is to native-language processing. One way to measure language processing is through the use of scalp-recorded electroencephalography (EEG). Event-related potentials (ERPs) are specific patterns found in EEG recordings. The P600 is an ERP characterized by a brief increase in voltage 600 ms after a stimulus with a syntactic anomaly like **“He is read his book,”* allowing measurement of whether a subject recognizes an error. Learners show native-like P600s quite early, after about 80 hours of classroom instruction. In native speakers, morphologically complex verbs elicit a larger P600 when ungrammatical than monomorphemic verbs. A morphologically complex verb is one made of more than one morpheme, like *“eat-ing.”* For example **“The sheep should eating,”* elicits a larger response than **“The sheep were eat.”* Native speakers of Mandarin, unexposed to any other language before age five, will be recruited through the Psychology Subject Pool. They will be presented with English stimuli adapted from a list of 120 sentences in a full 2x2 cross of grammaticality and complexity. Each participant will see one version of each sentence, plus an additional 60 grammatical filler sentences. By averaging across like trials, variance due to possible lexical effects is removed and the effects of grammaticality and complexity are isolated. Presumably, native speakers use the optimal processing strategy, indicated by P600 variability. If learners show variance, it will indicate that their language processing is more native-like. If they don't, it will indicate that learners at the ability tested do not have access to fully native-like processing. Therefore, I hypothesize that, of the non-native speakers showing P600 responses to verb violations, only the most advanced will show variation, indicating adoption of the optimal processing strategy. Findings will help us understand how new languages are learned, and possibly offer pedagogical suggestions.